

Exercise 4.1 (Revised) – Chapter 4 – Linear Equations In Two Variables – Ncert Solutions class 9 – Maths

Updated On 11-02-2025 By Lithanya

Chapter 4 – Linear Equations in Two Variables – NCERT Solutions Class 9 Maths

Ex 4.1 Question 1.

The cost of a notebook is twice the cost of a pen. Write a linear equation in two variables to represent this statement. (Take the cost of a notebook to be Rs x and that of a pen to be Rs y).

Answer.

Let the cost of a notebook be Rs. x .

Let the cost of a pen be Rs. y .

We need to write a linear equation in two variables to represent the statement, "Cost of a notebook is twice the cost of a pen".

Therefore, we can conclude that the required statement will be $x = 2y$.

Ex 4.1 Question 2.

Express the following linear equations in the form $ax + by + c = 0$ and indicate the values of a, b and c in each case:

(i) $2x + 3y = 9.\overline{35}$

(ii) $x - \frac{y}{5} - 10 = 0$

(iii) $-2x + 3y = 6$

(iv) $x = 3y$

(v) $2x = -5y$

(vi) $3x + 2 = 0$

(vii) $y - 2 = 0$

(viii) $5 = 2x$

Answer.

(i) $2x + 3y = 9.\overline{35}$

We need to express the linear equation $2x + 3y = 9.\overline{35}$ in the form $ax + by + c = 0$ and indicate the values of a, b and c .

$2x + 3y = 9.\overline{35}$ can also be written as $2x + 3y - 9.\overline{35} = 0$.

We need to compare the equation $2x + 3y - 9.\overline{35} = 0$ with the general equation $ax + by + c = 0$, to get the values of a, b and c .

Therefore, we can conclude that $a = 2, b = 3$ and $c = -9.\overline{35}$

(ii) $x - \frac{y}{5} - 10 = 0$

We need to express the linear equation $x - \frac{y}{5} - 10 = 0$ in the form $ax + by + c = 0$ and indicate the values of a, b and c .

$x - \frac{y}{5} - 10 = 0$ can also be written as $1 \cdot x - \frac{y}{5} - 10 = 0$.

We need to compare the equation

$1 \cdot x - \frac{y}{5} - 10 = 0$

with the general equation $ax + by + c = 0$, to get the values of a, b and c .



Therefore, we can conclude that

$$a = 1, b = -\frac{1}{5} \text{ and } c = -10$$

(iii) $-2x + 3y = 6$

We need to express the linear equation $-2x + 3y = 6$ in the form $ax + by + c = 0$ and indicate the values of a, b and c .

$$-2x + 3y = 6 \text{ can also be written as } -2x + 3y - 6 = 0.$$

We need to compare the equation $-2x + 3y - 6 = 0$ with the general equation $ax + by + c = 0$, to get the values of a, b and c .

Therefore, we can conclude that $a = -2, b = 3$ and $c = -6$.

(iv) $x = 3y$

We need to express the linear equation $x = 3y$ in the form $ax + by + c = 0$ and indicate the values of a, b and c .

$$x = 3y \text{ can also be written as } x - 3y + 0 = 0.$$

We need to compare the equation $x - 3y + 0 = 0$ with the general equation $ax + by + c = 0$, to get the values of a, b and c .

Therefore, we can conclude that $a = 1, b = -3$ and $c = 0$.

(v) $2x = -5y$

We need to express the linear equation $2x = -5y$ in the form $ax + by + c = 0$ and indicate the values of a, b and c .

$$2x = -5y \text{ can also be written as } 2x + 5y + 0 = 0.$$

We need to compare the equation $2x + 5y + 0 = 0$ with the general equation $ax + by + c = 0$, to get the values of a, b and c .

Therefore, we can conclude that $a = 2, b = 5$ and $c = 0$.

(vi) $3x + 2 = 0$

We need to express the linear equation $3x + 2 = 0$ in the form $ax + by + c = 0$ and indicate the values of a, b and c .

$$3x + 2 = 0 \text{ can also be written as } 3x + 0 \cdot y + 2 = 0.$$

We need to compare the equation $3x + 0 \cdot y + 2 = 0$ with the general equation $ax + by + c = 0$, to get the values of a, b and c .

Therefore, we can conclude that $a = 3, b = 0$ and $c = 2$.

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(vii) $y - 2 = 0$

We need to express the linear equation $y - 2 = 0$ in the form $ax + by + c = 0$ and indicate the values of a, b and c .

$$y - 2 = 0 \text{ can also be written as } 0 \cdot x + 1 \cdot y - 2 = 0.$$

We need to compare the equation $0 \cdot x + 1 \cdot y - 2 = 0$ with the general equation $ax + by + c = 0$, to get the values of a, b and c .

Therefore, we can conclude that $a = 0, b = 1$ and $c = -2$.

(viii) $5 = 2x$

We need to express the linear equation $5 = 2x$ in the form $ax + by + c = 0$ and indicate the values of a, b and c .

$$5 = 2x \text{ can also be written as } -2x + 0 \cdot y + 5 = 0.$$

We need to compare the equation $-2x + 0 \cdot y + 5 = 0$ with the general equation $ax + by + c = 0$, to get the values of a, b and c .

Therefore, we can conclude that $a = -2, b = 0$ and $c = 5$.



Exercise 4.2 (Revised) - Chapter 4 - Linear Equations In Two Variables - Ncert Solutions class 9 - Maths

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Chapter 4 - Linear Equations in Two Variables - NCERT Solutions Class 9 Maths

Ex 4.2 Question 1.

Which one of the following options is true, and why?

$y = 3x + 5$ has

- (i) a unique solution,
- (ii) only two solutions,
- (iii) infinitely many solutions

Answer.

We need to the number of solutions of the linear equation $y = 3x + 5$.

We know that any linear equation has infinitely many solutions.

Justification:

If $x = 0$ then $y = 3 \times 0 + 5 = 5$

If $x = 1$ then $y = 3 \times 1 + 5 = 8$

If $x = -2$ then $y = 3 \times (-2) + 5 = -1$

Similarly, we can find infinite many solutions by putting the values of x .

Ex 4.2 Question 2.

Write four solutions for each of the following equations:

- (i) $2x + y = 7$
- (ii) $\pi x + y = 9$
- (iii) $x = 4y$

Answer.

$$2x + y = 7$$

We know that any linear equation has infinitely many solutions.

Let us put $x = 0$ in the linear equation $2x + y = 7$, to get

$$2(0) + y = 7 \Rightarrow y = 7$$

Thus, we get first pair of solution as $(0, 7)$.

Let us put $x = 2$ in the linear equation $2x + y = 7$, to get

$$2(2) + y = 7 \Rightarrow y + 4 = 7 \Rightarrow y = 3.$$

Thus, we get second pair of solution as $(2, 3)$.

Let us put $x = 4$ in the linear equation $2x + y = 7$, to get

$$2(4) + y = 7 \Rightarrow y + 8 = 7 \Rightarrow y = -1$$

Thus, we get third pair of solution as $(4, -1)$.

Let us put $x = 6$ in the linear equation $2x + y = 7$, to get
 $2(6) + y = 7 \Rightarrow y + 12 = 7 \Rightarrow y = -5$.

Thus, we get fourth pair of solution as $(6, -5)$.

Therefore, we can conclude that four solutions for the linear equation $2x + y = 7$ are $(0, 7), (2, 3), (4, -1)$ and $(6, -5)$.

(ii) $\pi x + y = 9$

We know that any linear equation has infinitely many solutions.

Let us put $x = 0$ in the linear equation $\pi x + y = 9$, to get

$$\pi(0) + y = 9 \Rightarrow y = 9$$

Thus, we get first pair of solution as $(0, 9)$.

Let us put $y = 0$ in the linear equation $\pi x + y = 9$, to get

$$\pi x + (0) = 9 \Rightarrow x = \frac{9}{\pi}$$

Thus, we get second pair of solution as $\left(\frac{9}{\pi}, 0\right)$.

Let us put $x = 1$ in the linear equation $\pi x + y = 9$, to get

$$\pi(1) + y = 9 \Rightarrow y = \frac{9}{\pi}$$

Thus, we get third pair of solution as $\left(1, \frac{9}{\pi}\right)$.

Let us put $y = 2$ in the linear equation $\pi x + y = 9$, to get

$$\pi x + 2 = 9 \Rightarrow \pi x = 7 \Rightarrow x = \frac{7}{\pi}$$

Thus, we get fourth pair of solution as $\left(\frac{7}{\pi}, 2\right)$.

Therefore, we can conclude that four solutions for the linear equation $\pi x + y = 9$ are $(0, 9), \left(\frac{9}{\pi}, 0\right), \left(1, \frac{9}{\pi}\right)$ and $\left(\frac{7}{\pi}, 2\right)$.

(iii) $x = 4y$

We know that any linear equation has infinitely many solutions.

Let us put $y = 0$ in the linear equation $x = 4y$, to get

$$x = 4(0) \Rightarrow x = 0$$

Thus, we get first pair of solution as $(0, 0)$.

Let us put $y = 2$ in the linear equation $x = 4y$, to get

$$x = 4(2) \Rightarrow x = 8$$

Thus, we get second pair of solution as $(8, 2)$.

Let us put $y = 4$ in the linear equation $x = 4y$, to get

$$x = 4(4) \Rightarrow x = 16$$

Thus, we get third pair of solution as $(16, 4)$.

Let us put $y = 6$ in the linear equation $x = 4y$, to get

$$x = 4(6) \Rightarrow x = 24$$

Thus, we get fourth pair of solution as $(24, 6)$.

Therefore, we can conclude that four solutions for the linear equation $x = 4y$ are $(0, 0), (8, 2), (16, 4)$ and $(24, 6)$.

Ex 4.2 Question 3.

Check which of the following are solutions of the equation $x - 2y = 4$ and which are not:

(i) $(0, 2)$

(ii) $(2, 0)$

(iii) $(4, 0)$

(iv) $(\sqrt{2}, 4\sqrt{2})$

(v) $(1, 1)$

Answer.

(i) $(0, 2)$

We need to put $x = 0$ and $y = 2$ in the L.H.S. of linear equation $x - 2y = 4$, to get

$$(0) - 2(2) = -4$$

\therefore L.H.S. \neq R.H.S.

Therefore, we can conclude that $(0, 2)$ is not a solution of the linear equation $x - 2y = 4$.

(ii) $(2, 0)$

We need to put $x = 2$ and $y = 0$ in the L.H.S. of linear equation $x - 2y = 4$, to get

$$(2) - 2(0) = 2$$

\therefore L.H.S. \neq R.H.S.

Therefore, we can conclude that $(2, 0)$ is not a solution of the linear equation $x - 2y = 4$.

(iii) $(4, 0)$

We need to put $x = 4$ and $y = 0$ in the linear equation $x - 2y = 4$, to get

$$(4) - 2(0) = 4$$

\therefore L.H.S. = R.H.S.

Therefore, we can conclude that $(4, 0)$ is a solution of the linear equation $x - 2y = 4$.

(iv) $(\sqrt{2}, 4\sqrt{2})$

We need to put $x = \sqrt{2}$ and $y = 4\sqrt{2}$ in the linear equation $x - 2y = 4$, to get

$$(\sqrt{2}) - 2(4\sqrt{2}) = -7\sqrt{2}$$

\therefore L.H.S. \neq R.H.S.

Therefore, we can conclude that $(\sqrt{2}, 4\sqrt{2})$ is not a solution of the linear equation $x - 2y = 4$.

(v) $(1, 1)$

We need to put $x = 1$ and $y = 1$ in the linear equation $x - 2y = 4$, to get

$$(1) - 2(1) = -1$$

\therefore L.H.S. \neq R.H.S.

Therefore, we can conclude that $(1, 1)$ is not a solution of the linear equation $x - 2y = 4$.

Ex 4.2 Question 4.

Find the value of k , if $x = 2, y = 1$ is a solution of the equation $2x + 3y = k$.

Answer.

We know that, if $x = 2$ and $y = 1$ is a solution of the linear equation $2x + 3y = k$, then on substituting the respective values of x and y in the linear equation $2x + 3y = k$, the LHS and RHS of the given linear equation will not be effected.

$$\therefore 2(2) + 3(1) = k \Rightarrow k = 4 + 3 \Rightarrow k = 7$$

Therefore, we can conclude that the value of k , for which the linear equation $2x + 3y = k$ has $x = 2$ and $y = 1$ as one of its solutions is 7.

